

Application No. 10/735996 (Docket: CNTR.2152)
37 CFR 1.111 Amendment dated 09/25/2006
Reply to Office Action of 08/15/2006

REMARKS/ARGUMENTS

In the Office Action, the Examiner noted that claims 1-6 and 8-29 are pending in the application. The Examiner additionally stated that claims 1-6 and 8-29 are rejected. By this amendment, claims 2, 6, 12, 16, and 26 are cancelled and claims 1, 3, 11, 13, and 21 are amended. Hence, claims 1, 2-5, 8-11, 13-15, 17-25 and 27-29 are pending in the application.

Applicant hereby requests further examination and reconsideration of the application, in view of the foregoing amendments.

In the Claims

Rejections Under 35 U.S.C. §103(a)

The Examiner rejected claims 1, 2, 4-6, 11, 12, 14-16, 21, 22, and 24-26 under 35 U.S.C. 102(b) as being anticipated by Carbine et al., U.S. Patent No. 5,222,244 (hereinafter, Carbine) in view of the background of the application. Applicant respectfully traverses the Examiner's rejections.

Regarding claim 1, the Examiner noted:

A microprocessor apparatus, for precluding a pipeline stall due to microcode ROM access delay, the microprocessor apparatus comprising:

a plurality of micro instruction queue entries, each corresponding to an instruction, and said each comprising a plurality of micro instructions and a microcode entry point (col. 6, lines 58-68; col. 7, lines 1-19); and

early access logic, coupled to said micro instruction queue, configured to employ said microcode entry point to access a microcode ROM prior to when said microcode entry point is provided to register logic, whereby said microcode ROM provides a first micro instruction to said register logic when said first micro instruction is required by said register logic (col. 8, lines 39-46).

The Examiner stated that Carbine et al. do not teach the microprocessor apparatus comprising:

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a translator, coupled to said plurality of micro instruction queue entries, configured to generate said microcode instruction queue entry (column 6, lines 58-68; column 7, lines 1-19), nor does Carbine disclose how the contents of the queue entries are determined. The Examiner argued however that applicant has disclosed as prior art that the combination of a microcode ROM and a direct translator for the sequencing of macroinstructions is known in the art and thus the combination of the microcode ROM and a direct translator in coordination with the microcode queue would be a viable, beneficial solution in Carbine. The Examiner added that an opposing possibility would be to statically populate the queue with the most commonly used instructions and that one of ordinary skill in the pertinent art would have recognized that this would not be extremely useful because it would only provide the benefits of not stalling on a microcode ROM instruction in the instance of encountering a common instruction, which might not extend across different applications. In contrast, the Examiner argued that a queue that is dynamically populated by a translator when the microcode ROM instruction is first encountered will provide the benefits of the invention to all microcode ROM instructions. The Examiner concluded that it would have been obvious to one of ordinary skill in the pertinent art at the time of the applicant's invention that providing a translator to generate the microinstruction queue entries in Carbine would provide the benefit of not stalling on any microcode ROM instruction, rather than a select few.

Applicant respectfully disagrees with the Examiner's rejection of claim 1 for the following reasons. First, the invention of Carbine does not teach a micro instruction queue, for receiving a plurality of queue entries from a translator, and for providing said plurality of queue entries to register logic. Carbine does not teach such a queue. Rather, Carbine teaches a translation ROM (122) which is a large PLA which contains micro instructions. The microinstructions are the first two, or sometimes three microinstructions that are part of a microcode flow that implements a particular complex instruction. (col. 6, lines 58-63) This is substantially equivalent to Applicant's translator, but is in no way a queue of translated micro instructions, as is recited in claim 1. Secondly, since Carbine does not teach a micro instruction queue, which provides queue entries including microcode entry point to access a microcode ROM to register

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logic, it does not follow that Carbine teaches early access logic that enables the microcode ROM to provide a first micro instruction to the register logic when the first micro instruction is required. The translation ROM 122 which the Examiner points out in col. 8, lines 39-43, provides the first part of a micro instruction flow. Applicant's early access logic, in contrast, provides the second part of the micro instruction flow (from the microcode ROM) that corresponds to a complex instruction.

Applicant has amended claim 1 to clarify that that within the present invention there is a translator that generates micro instruction queue entries, there is a micro instruction queue that receives the queue entries in order, and there is register logic that receives the queue entries from the micro instruction queue, in the same order. Furthermore, claim 1 recites a micro code ROM that is distinct from the micro instruction queue, where a microcode entry point is employed to access the microcode ROM prior to when said each of said plurality of queue entries is provided to the register logic, whereby a first one of said second micro instructions is provided to the register logic when the first one of said second micro instructions is required by said register logic, and wherein the early access logic employs the microcode entry point when the microcode entry point is within a bottom queue entry, said bottom queue entry comprising one of the each of said plurality of micro instruction queue entries, and wherein the bottom queue entry will be provided to the register logic during a next clock cycle. These elements and limitations are not taught by either Carbine nor by the background. It is clear that Carbine's microcode translation ROM 122 is just that and is not a queue of translated micro instructions, nor is Carbine's translation ROM 122 equivalent to the early access logic as is disclosed by Applicant. For these reasons, Applicant respectfully requests that the rejection of claim 1 be withdrawn.

By this amendment, claims 2 and 6 are cancelled, thereby rendering the rejections moot.

With respect to claims 3-5 and 8-10, these claims depend from claim 1 and add further limitations that are neither anticipated nor made obvious by Carbine, the background, or Carbine and the background in combination. Accordingly, Applicant respectfully requests that the Examiner withdraw his rejections to claims 3-5 and 8-10.

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Claims 11 and 21 recite substantially the same elements and limitations which are argued above in traversal of the rejection of claim 1. Consequently, it is requested that the rejections of claims 11 and 21 be withdrawn as well.

By this amendment, claims 12, 16, and 26 are cancelled, thereby rendering the rejections moot.

With respect to claims 13-15 and 17-20, these claims depend from claim 11 and add further limitations that are neither anticipated nor made obvious by Carbine, the background, or Carbine and the background in combination.. Accordingly, Applicant respectfully requests that the Examiner withdraw his rejections to claims 13-15 and 17-20.

With respect to claims 22-25 and 27-29, these claims depend from claim 21 and add further limitations that are neither anticipated nor made obvious by Carbine, the background, or Carbine and the background in combination.. Accordingly, Applicant respectfully requests that the Examiner withdraw his rejections of claims 22-25 and 27-29.

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CONCLUSIONS

In view of the arguments advance above, Applicant respectfully submits that claims 1, 3-5, 8-11, 13-15, 17-25, and 27-29 are in condition for allowance. Reconsideration of the rejections is requested, and allowance of the claims is solicited.

Applicant earnestly requests that the Examiner contact the undersigned practitioner by telephone if the Examiner has any questions or suggestions concerning this amendment, the application, or allowance of any claims thereof.

I hereby certify under 37 CFR 1.8 that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office on the date of signature shown below.

Respectfully submitted,
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